Energy Efficiency in Connecticut: Engine of Economic Growth

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Energy efficiency is emerging as a key policy solution to address high energy costs and the threat of climate change. As investments in energy efficiency programs increase, there is a need to understand economic effects on individual program participants and on the economy as a whole. ENE conducted a study to quantify the macroeconomic impacts of increased energy efficiency investments in New England, where efficiency has assumed a leading role in energy policy. Several New England states have increased efficiency investments significantly in recent years, and others are planning dramatic funding increases. As decision makers nationwide consider energy policy reform, New England's increasing focus on efficiency provides a prime case-study for evaluating efficiency's impact on economic output and job growth. The following document summarizes the modeling results for Connecticut. The full report, "Energy Efficiency: Engine of Economic Growth," is available at ENE's Web site: http://www.env-ne.org/resources/open/p/id/964

Results for Connecticut

Annual efficiency program budgets were modeled to ramp up in Connecticut to $259 million for electricity, $66 million for natural gas, and $108 million for unregulated fuels. Benefits from increased efficiency investments in Connecticut would be significant for each fuel type. Increasing efficiency program investments to levels needed to capture all cost-effective electric efficiency over 15 years ($4.4 billion invested by program administrators) would increase economic activity by $40 billion (2008 dollars),[1] as consumers spend energy bill savings in the wider economy. Sixty-four percent of increased economic activity ($25 billion) would contribute to the gross state product (GSP), with $18 billion returned to workers through increased real household income and employment equivalent to 183,000 job years (one full-time job for a period of one year). Over 15 years, increased natural gas efficiency ($930 million invested by program administrators) would increase state economic activity by $10 billion, boost GSP by $6.6 billion, and increase household income by $4.6 billion while creating 42,000 new job years of employment. Unregulated fuels efficiency programs ($1.6 billion invested by program administrators) would increase state economic activity over 15 years by $18 billion, boosting GSP by $12 billion, and increasing real household income by $7.8 billion while creating 78,000 job years of new employment.

The effectiveness of efficiency investments can be evaluated by considering economic benefits relative to efficiency program dollars invested. The following table shows the absolute and relative economic benefits of the simultaneously-modeled energy efficiency investments for Connecticut.

Table 1. Summary of Connecticut Economic Impacts

	Electric	Natural Gas	Unregulated Fuels
Total Efficiency Program Costs ($Billions)	4.4	.93	1.6
Increase in GSP ($Billions)	25	6.6	12
Maximum annual GSP Increase ($Billions)	1.37	0.41	0.65
Percent of GSP Increase Resulting from Efficiency Spending	11%	10%	8%
Percent of GSP Increase Resulting from Energy Savings	89%	90%	92%
Dollars of GSP Increase per $1 of Program Spending	5.7	7.0	7.1
Increase in Employment (Job Years)	183,000	42,000	78,000
Maximum annual Employment Increase (Jobs)	9,700	2,700	4,600
Percent of Employment Increase from Efficiency Spending	15%	14%	11%
Percent of Employment Increase from Energy Savings	85%	86%	89%
Job-Years per $Million of Program Spending	41	45	48

[1] 2008 is the dollar year basis for all figures unless otherwise indicated

The macroeconomic benefits of efficiency derive from changes in the economy that occur as a result of increased spending on efficiency measures and decreased spending on energy. The majority of these impacts (77-90%) result from the energy savings realized by households and business. Lower energy costs cause other forms of consumer spending (such dining out or discretionary purchasing) to increase. Lower energy bills reduce the costs of doing business in the region, bolstering the global competitiveness of local employers and promoting additional growth.

The total energy savings and reduced greenhouse gas emissions associated with the modeled levels of efficiency investments are also very significant. The following table illustrates these savings.

Table 2: Summary of Connecticut Energy Saved and Greenhouse Gas Emissions Avoided

	Electric	Natural Gas	Unregulated Fuels
Energy Savings	**(GWh)**	**(TBTU)**	**(TBTU)**
Maximum annual savings	8,600	22	29
Maximum savings vs. Business as Usual	25%	20%	28%
Lifetime savings (15 years of programs)	125,900	272	368
Equivalent GHG Emissions Avoided	**(Millions short tons)**	**(Millions short tons)**	**(Millions short tons)**
Maximum annual avoided emissions	4.3	1.3	2.3
Maximum annual avoided emissions vs. 2005 total Connecticut Emissions	9.7%	2.9%	5.2%
Lifetime avoided emissions (15 years of programs)	72	21	41

About the Study

The study uses a proprietary, multi-state policy forecasting tool by Regional Economic Models, Inc. (REMI) to project macroeconomic impacts of policy options as compared to a baseline. For this study, the model operates using assumptions about efficiency program budgets, costs to achieve energy savings, and energy prices and consumption levels during the modeled period. ENE developed modeling assumptions based on conservative extrapolations from current and proposed efficiency program data. The modeling assumptions and results of the report were vetted by an Advisory Board of industry professionals, regulators and others experienced in the field and in the region. Expanded efficiency programs were modeled over 15 years, and funding ramp-up periods were incorporated to reflect sustainable program growth rates. The model continues for another 20 years to capture the economic benefits achieved over the life of efficiency measures.

In order to investigate the complementary nature of efficiency programs across jurisdictions, two scenarios were modeled for each fuel: first where each state acts alone (the "individual" scenario); and second where all New England states implement at once (the "simultaneous" scenario). In all cases simultaneous action resulted in greater economic benefits to the region, as energy savings improved states' relative national competitiveness and increased trade among states and with the rest of the world.

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